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10/649,602	08/27/2003	Karl Schrodinger	M&N-IT-557	5514

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EXAMINER
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GARCIA, LUIS

ART UNIT	PAPER NUMBER
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2613

DATE MAILED: 08/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/649,602

Applicant(s)

SCHRODINGER, KARL

Examiner

Luis F. Garcia

Art Unit

2613

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on August 27, 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 14-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 14-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on August 27, 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

### DETAILED ACTION

1. Claims 14-26 are pending instant application.

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. **Claims 14, 16, 17, 22 and 24 are rejected** under 35 U.S.C. 102(e) as being anticipated by Faska et al (US 2006/0120731) hereinafter referred to as Faska.

**Regarding claim 14**, Faska discloses an optical receiver circuit (**FIG. 8**), comprising:

a differential amplifier including a first input and a second input (**FIG. 8 (882-differential amplifier)**);

an optical reception device connected to said first input of said differential amplifier, said optical reception device having an electrical behavior in an illumination-free case (**FIG. 8 (830-photodiode) and ¶0003 in which the photodiode (830) is input into a differential amplifier, via first input; furthermore, photodiode (830) exhibits behavior in an illumination free case (e.g photodiode still outputs current even with no illumination)**); and

an electrical element for simulating the electrical behavior of said optical reception device in the illumination-free case, said electrical element connected to said second input of said differential amplifier (**FIG. 8 (820-photodiode) and ¶0003 in which the electrical behavior of the photodiode-830 is simulated by using a second photodiode (electrical element) which is connected to the differential amplifier (882) via a second input).**

**Regarding claim 16,** Faska discloses the optical receiver circuit according to claim 14 as applied above.

Faska further discloses wherein: said electrical element is formed by a darkened, further reception device (**FIG. 8 (820-photodiode, 680-dark detector) and ¶0035 in which the dark detector is formed by a darkened photodiode (further reception device)).**

**Regarding claim 17,** Faska discloses the optical receiver circuit according to claim 16 as applied above.

Faska further discloses wherein: said optical reception device and said further reception device are monolithically integrated on a chip (**FIG. 8 and ¶0035 in which both photodiodes (820,830) are grown on the same substrate (e.g monolithically integrated)).**

**Regarding claim 22,** rejected as stated in claim 14 in which it is a matter of design choice as to how many power supplies are used in Faksa's optical receiver (e.g. one common power supply or a power supply for each circuit).

**Regarding claim 24**, Faska discloses the optical receiver circuit according to claim 14 as applied above.

Faska further discloses wherein: said optical reception device is a photodiode; and said electrical element is a photodiode (**FIG. 8 (photodiodes-820, 830) and ¶0035 in which the optical reception device (830) and the electrical element (820) is a photodiode**).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. **Claims 23 is rejected** under 35 U.S.C. 103(a) as being unpatentable over Faska.

**Regarding claim 23**, rejected as stated in claim 22 in which it is well known in the art to have a power supply filter (e.g. low-pass filter connect to the common power supply) in order to reduce noise and parasitic effects in the power supply, e.g. provides a "clean" power supply.

4. **Claims 15 and 18-21 rejected** under 35 U.S.C. 103(a) as being unpatentable over Faska in view of Nomura (US 6,731,881).

Regarding claim 15, Faska discloses the optical receiver circuit according to claim 14 as applied above.

Faska does not expressly disclose further comprising: a first preamplifier connecting said optical reception device to said differential amplifier; and a second preamplifier connecting said electrical element to said differential amplifier.

Nomura teaches comprising: a first preamplifier connecting said optical reception device to said differential amplifier (**FIG. 4 (2-transimpedance amplifier) in which the transimpedance amplifier connects the optical reception device (1) to the differential amplifier (7)**); and a second preamplifier connecting said electrical element to said differential amplifier (**FIG. 4 (5-transimpedance amplifier) in which the transimpedance amplifier connects the electrical element (4) to the differential amplifier**).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Faska and incorporate Nomura's teachings of using preamplifiers to boost the received photodiode signal. The motivation being that this allows the photodiode signal to be amplified before entering the differential amplifier; thereby, allowing the preamplifier to compensate for the inherent losses incurred the by the photodiode signal (e.g. transmission line loss, electrical coupling loss, etc...). NOTE: Faska discloses in ¶0031 that the photodiodes used can be chosen to output voltage or current, in which the photodiodes that output current would need a TIA in order to convert the current to a voltage for input in to the difference amplifier (as is a well known configuration in optical receivers).

Regarding claims 18 and 19, rejected as stated in claim 15 in which both transimpedance amplifiers are identical.

Regarding claim 20, Faska in view of Nomura disclose the optical receiver circuit according to claim 18 as applied above.

Faska further discloses comprising: an integrated control circuit (**FIG. 8 (870-electronic chip) and ¶0036 in which the integrated electronic chip contains control circuitry**);

Faska does not expressly disclose said first preamplifier being a transimpedance amplifier having a feedback impedance with a magnitude being settable by a user via said integrated control circuit; and said second preamplifier being a transimpedance amplifier having a feedback impedance with a magnitude being settable by a user via said integrated control circuit.

Nomura teaches said a preamplifier being a transimpedance amplifier having a feedback impedance with a magnitude being settable by a user (**FIG. 6 (5-transimpedance amplifier, 6-variable resistor) in which the transimpedance amplifier has a variable feedback impedance set by a user**).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Faska and incorporate Nomura's teachings of using variable gain preamplifiers to boost the received photodiode signal. The motivation being that this allows the designer to vary the gain of the amplifier, in order to optimize the received signal. Thereby, allowing to a more robust system capable of dealing with low and high received signals (e.g. low signal-increase gain, high signal-decrease gain).

**Regarding claim 21**, rejected as stated in claim 20 rejection in which control over both variable impedances is needed in order to vary the gain of both transimpedance amplifiers; therefore, it would have been obvious to one of ordinary skill in the art to use Faska's integrated control circuit to control both variable feedback impedances in order to have explicit control of the gain of each preamplifier. Thereby, allowing for the dynamic adjustment preamplifier gain.

5. **Claims 25-26 are rejected** under 35 U.S.C. 103(a) as being unpatentable over Faska in view of Lewis (US 7,002,131).

**Regarding claims 25**, Faska discloses the receiver circuit according to claim 14 as applied above.

Faska does not expressly disclose comprising: a package for packaging said differential amplifier, said optical reception device, and said electrical element, said package being selected from the group consisting of a T0-46 package, a TSSOP10 package, and a VQFN20 package.

Lewis teaches a package for packaging an optical receiver, said package being selected from the group consisting of a T0-46 package, a TSSOP10 package, and a VQFN20 package (**FIG. 3A,B,C (300-optical receiver, 301-T0-46 package)**).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Faska and incorporate Lewis' teachings of an optical receiver packaged in a T0-46 package. The motivation being that this allows the optical receiver to be more easily implemented in an optical system, by simply connecting the pins from



the TO-46 package to the appropriate connections. Thereby, allowing for easier and faster implementation of an optical receiver in an optical system.

**Regarding claim 26**, Faska in view of Lewis disclose the receiver circuit according to claim 25 as applied above.

Faska further discloses comprising: an integrated control circuit having a control terminal (**FIG. 8 (870-electronic chip) and ¶0036 in which the integrated electronic chip contains control circuitry which inherently has a control terminal in order for the designer to be able to vary the control parameters**).

Faska does not expressly disclose said package having a terminal pin forming said control terminal.

Lewis teaches said package having a terminal pin forming said control terminal (**FIG. 3A,B,C in which the TO-46 package has pins for connect optical receiver circuitry**).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Faska and incorporate Lewis' teaching of a package with control pins. The motivation being that this allows the optical receiver to be easily controlled via a pin from the TO-46 package. Thereby, allowing for easier and faster implementation/control of an optical receiver in an optical system.

***Conclusion***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

MAX3970-transimpdance amplifier spec sheet (Rev 2, 1/02) in which the "Typical Application Circuit" consists of a photodiode connected to a transimpedance amplifier with a gain determined by a feedback resistor/impedance; furthermore, this circuit contains supply filtering for removing noise from the power supply.

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7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luis F. Garcia whose telephone number is (571)272-7975. The examiner can normally be reached on 8-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken N. Vanderpuye can be reached on (571)272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LG



**KENNETH VANDERPUYE**  
**SUPERVISORY PATENT EXAMINER**